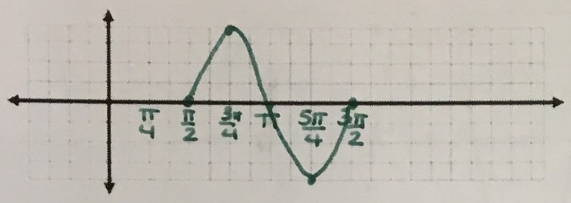
Review – Trigonometric Functions 4.5-4.8

Percent:_____

Name:
Date:
Period: Key

Graph one period of each of the following.

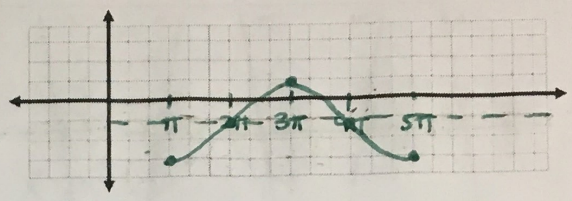
1. $y = 4\sin\left(2\left(x - \frac{\pi}{2}\right)\right)$



$\frac{2\pi}{2} = \pi$ Every $\frac{\pi}{4}$

Shift $\frac{\pi}{2}$ right

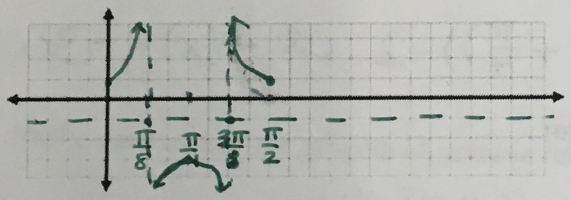
2. $y = -2\cos\left(\frac{1}{2}x - \frac{\pi}{2}\right) - 1 = -2\cos\left(\frac{1}{2}(x-\pi)\right) - 1$



$\frac{2\pi}{\frac{1}{2}} = 4\pi \longrightarrow$ Every π

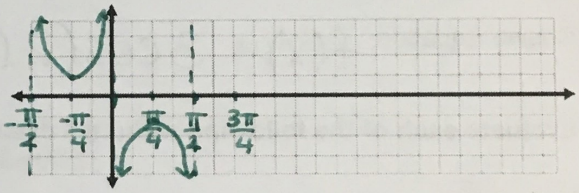
π right

3. $y = 2\sec(4x) - 1$



$\frac{2\pi}{4} = \frac{\pi}{2} \rightarrow$ Every $\frac{\pi}{8}$

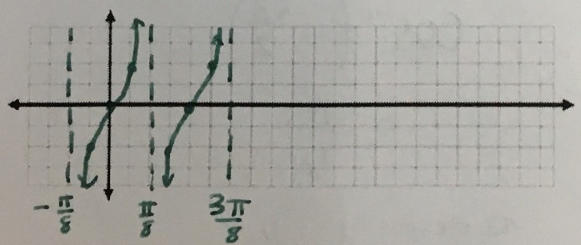
4. $y = \csc\left(2\left(x + \frac{\pi}{2}\right)\right) + 1$



$\frac{2\pi}{2} = \pi$ Every $\frac{\pi}{4}$

$\frac{\pi}{2}$ left

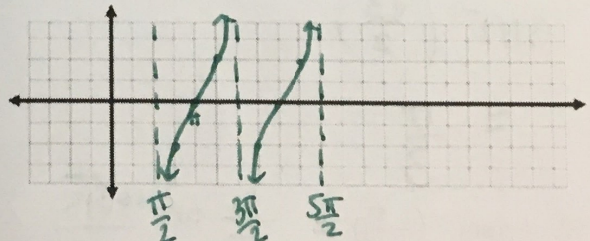
5. $y = 2\tan(4x)$



$-\frac{\pi}{2} < 4x < \frac{\pi}{2}$

$-\frac{\pi}{8} < x < \frac{\pi}{8}$

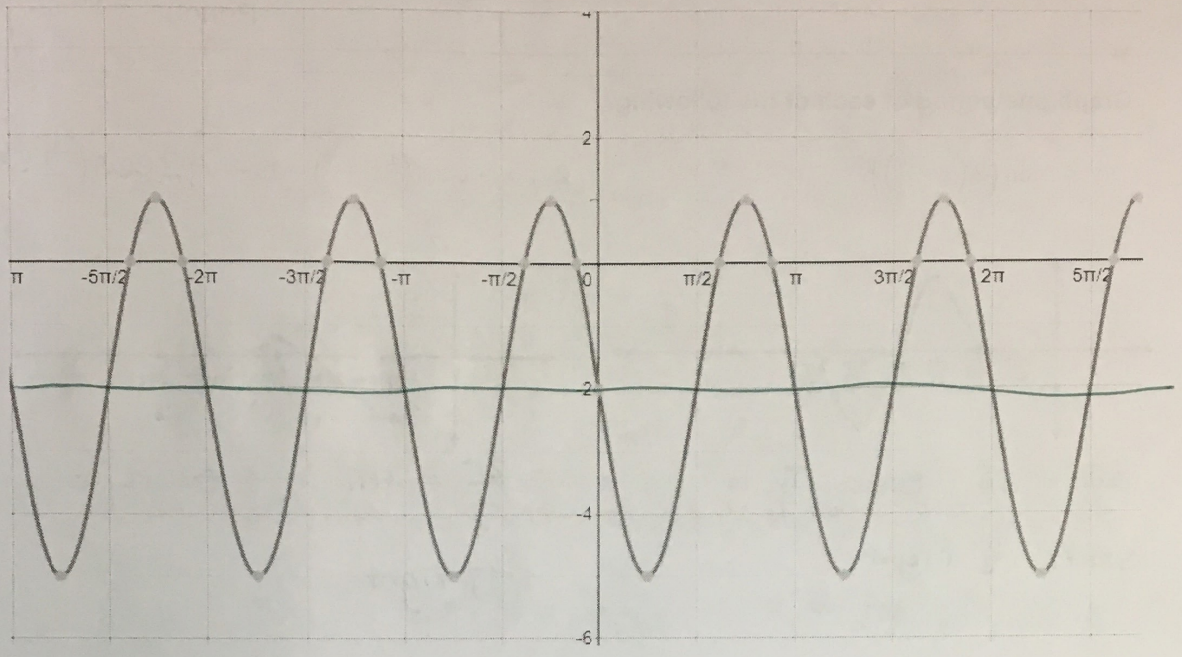
6. $y = -2\cot\left(x - \frac{\pi}{2}\right)$



$0 < x - \frac{\pi}{2} < \pi$

$\frac{\pi}{2} < x < \frac{3\pi}{2}$

7. Write one sine and one cosine equation for the following graph.



$\frac{2\pi}{B} = \pi$

$2 = B$

Sine Equation: $f(x) = 3\sin(2(x-\frac{\pi}{2}))-2$ OR $-3\sin(2x)-2 = f(x)$

Cosine Equation: $f(x) = 3\cos(2(x+\frac{\pi}{4}))-2$ OR $f(x) = -3\cos(2(x-\frac{3\pi}{4}))-2$

Evaluate each of the following without a calculator.

8. $\sin^{-1}\frac{\sqrt{2}}{2}$

$\frac{\pi}{4}$

9. $\tan^{-1}\left(-\frac{\sqrt{3}}{3}\right)$

$-\frac{\pi}{3}$

10. $\sin^{-1}(\sin\frac{\pi}{3})$

$\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$

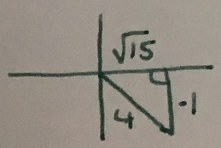
$= \frac{\pi}{3}$

11. $\cos^{-1}(\cos\frac{11\pi}{6})$

$\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$

$= \frac{\pi}{6}$

12. $\sec(\sin^{-1}\left(-\frac{1}{4}\right)) = \frac{4}{\sqrt{15}}$ or $\frac{4\sqrt{15}}{15}$

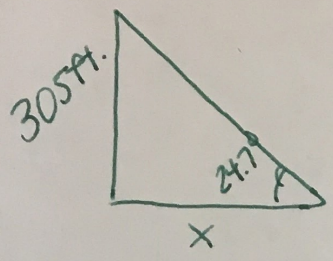


13. $\csc(\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right))$

$\csc\left(\frac{5\pi}{6}\right) = 2$

Solve each of the following.

14. The Statue of Liberty is approximately 305 feet tall. If the angle of elevation of a ship to the top of the statue is 24.7 degrees, how far, to the nearest foot, is the ship from the statue's base?

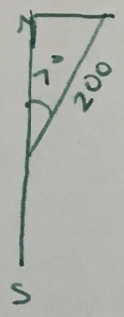


$$\tan(24.7^\circ) = \frac{305}{x}$$

$$\frac{305}{\tan(24.7)} = x$$

$$x = 663 \text{ ft.}$$

15. A boat leaves the entrance to a harbor and travels 200 miles on a bearing of N 7° E. How many miles north and how many miles east from the harbor has the boat traveled?



$$\sin 7^\circ = \frac{x}{200} \qquad x = 24.37 \text{ miles East}$$

$$\cos 7^\circ = \frac{x}{200} \qquad x = 198.51 \text{ miles North}$$

Make sure to review graphs of inverse functions!!!